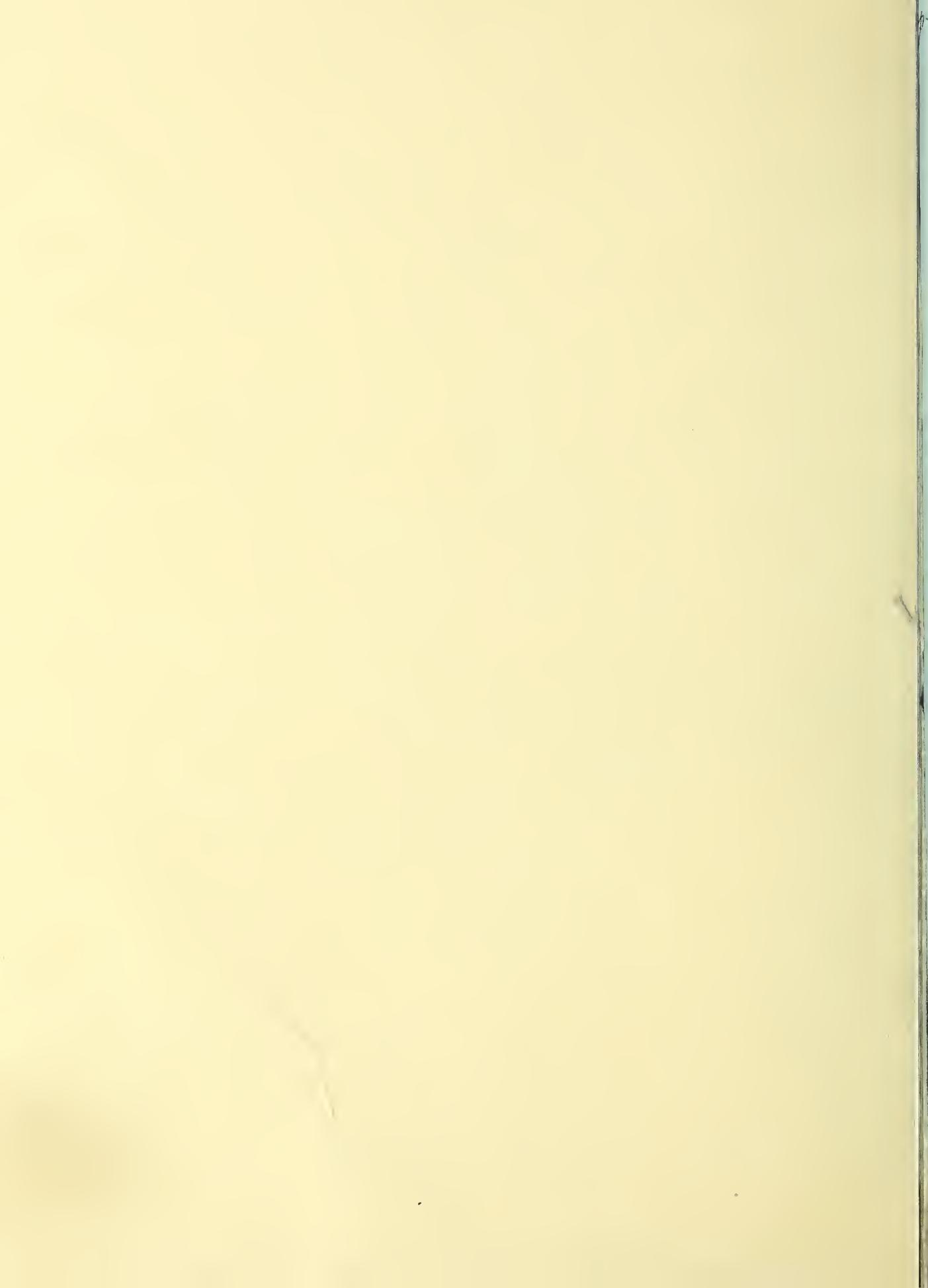


Historic, Archive Document

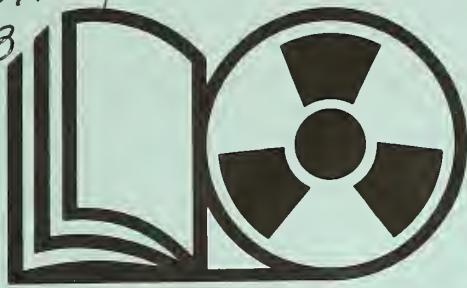
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AGRICULTURAL LIBRARIES INFORMATION NOTES

EVALUATION OF CAIN ONLINE, ST. PAUL CAMPUS LIBRARIES, UNIVERSITY OF MINNESOTA

Phyllis Reich, Chief Reference Librarian
Fred E. Hearth, Assistant Director

Since May, 1974, the St. Paul Campus Libraries of the University of Minnesota, under a grant from the National Agricultural Library, have been evaluating a CAIN online bibliographic search service to the University's faculty, research staff, extension personnel, and graduate students.

The CAIN file is created by the permutation of significant title words; non-descriptive titles are enriched or augmented with more meaningful terms. The searcher of the CAIN file must anticipate an author's terminology and design a search strategy without benefit of a list of subject headings or a thesaurus of descriptors. There is no assurance that the author and the searcher are using identical terms to describe the same items of information. The searcher must cope with both generic and specific entries, synonyms, near synonyms, adverbial and adjectival forms, as well as singular and plural forms. The system also presumes that the searcher is thoroughly familiar with the literature of agriculture and the related sciences.

Since the process described is basically a learning process, several questions arise. Is (1) better initial training needed? (2) could a good manual or guide overcome some of the problems? (3) is there a need for a better updating system on policy changes, techniques, etc.?

OBJECTIVES

This study, with these considerations in mind, was designed to:

1. Determine the reasons for search failures.

2. Identify the problems encountered in searching such a data base.
3. Determine how these problems may be mitigated within the present structure of the data base and the Lockheed Information Retrieval Service program by means of searching techniques.

Prospective users of the CAIN data base were interviewed prior to the actual searches, in order to draw upon the expertise of the subject specialist in formulating the search profile. They were asked to bring any articles relevant to the search requests to the interview. From these, and subsequent discussions, entry vocabularies and search profiles were established.

The requesters were present during the online searches and, in conjunction with the information specialist, made modifications in the search strategies based on the various browsing processes which are built into the system.

Requesters were asked to review printouts of searches and make a citation by citation evaluation of the results with respect to usefulness.

RESULTS AND DISCUSSION

A tabular analysis of the *precision performance* for various searches for which patron evaluations is available. Out of the total of 153 searches processed, only 46 evaluations were returned by requesters. Additional printouts were returned with overall evaluations, but without citation by citation analysis, or were returned without comment. For purposes of this study

these returns were not included. Precision percentages range from a low of 15% to a high of 100, with a mean precision recovery percentage of 65.8 for all searches analyzed. There appears to be no correlation between mean precision percentage and the number of citations retrieved, as shown by mean values when numbers of citations are grouped by 50 unit increments.

A recall performance analysis, which must be based upon a knowledge of *all* relevant documents in the file on a given subject irrespective of the terminology applied to those documents, was beyond the scope of this study. On the basis of user evaluations and the investigators' examination of the user annotated citations in conjunction with search strategies, the causes of search failures may be summarized as follows:

1. Inability to specify the desired concepts due to characteristics of the data base or the Lockheed program that were beyond the control of the searcher.
2. Failure to anticipate all the possible terms necessary for retrieval.
3. Failure of titles of relevant articles to reflect subject content adequately.
4. Improper search strategy.

INABILITY TO EXPRESS CONCEPTS

Consider the following two requests:

"What enzymes are involved in food processing operations?" "Which bacterial enzymes involved in cheese fermentation are located at the membrane surface?" As parallel searches of *Chemical Abstracts* demonstrated, many of the articles on each of the above subjects are given with very specific titles. The specific enzyme(s) rather than the terms ENZYME or ENZYMES appears in the titles. The searcher, therefore, must anticipate the solution to the proposed questions in order to retrieve relevant documents, *i.e.*, the searcher must include in the search strategy the names of specific enzymes. The searcher is confronted with a similar problem when faced with the question, "Which organic acids are present in the various stages of cheese processing and what roles do they play in the operation?" The use of the terms ACID and ACIDS alone produces irrelevant articles. A demand for a study of antibiotics in feedstuffs presents a similar situation. There is, in other words, a need to be able to generalize, to be able to express concepts generically, and yet have the ability to recall documents which are writ-

ten with very specific titles. Category codes partially compensate for this deficiency of the data base. However, a mechanism has yet to be employed to more effectively draw related terms together.

The Lockheed program presently permits right-truncation, enabling one to search word roots, *i.e.*, ENZYME*, where the asterisk indicates that the searcher does not wish to specify any of the letters which follow. The expression ENZYM* would retrieve titles containing, for example, the terms ENZYME, ENZYMES, and ENZYMATIC. It would, however, be highly desirable if it were possible to search suffixes by means of left-truncation. Given such a capability, a request for the terms *ASE, used in conjunction with the right-truncated ENZYM*, would recall most documents related to enzymes. Similarly, a search formulation based on the terms *CILLIN and *MYCIN would account for most of the antibiotic related articles in the file; *NITROSA-MINE would recall dimethylnitrosamine as well as nitrosamine references.

It is possible to express many concepts generically via the CAIN category codes. The more closely defined categories, which were incorporated into the system in 1972, provide a very powerful searching aid. Presumably, these will assume an even greater significance as citations are added to the data base. Presently, the pre-1972 citations represent almost one half of the file and it is, therefore, important to retrieve these in any search. One approach to this older literature is to design the search strategy around the new category codes for the purpose of identifying relevant terminology. (Thus, a combination of term selection, as outlined above, and selective use of older category codes may be required to assure optimum search success for these older materials.) Our experience is that attempts to retrieve earlier references solely by use of pre-1972 category codes contribute significantly to precision failures.

The investigators in many cases used multiple categories in a single search to great advantage, *e.g.*, a search on growth regulants in plants required the selection of several categories relating to plant materials. Under such circumstances, however, one might wish to consider the following: each user of the Lockheed program is allotted a specified amount of disc storage at the time of online entry. Disc space is used for two purposes: first, to store various index terms that have been selected and secondly, to form combinations of these terms per the searcher's instructions. For convenience, we will refer to the first type of disc space as "basic", and to the second as "operational".

We have been advised that Lockheed's CAIN program is designed to prevent the searcher from selecting an index term which would consume more than half of the unused portion of the disc storage space. The program rejects an attempt to exceed this fraction. This was apparently done with the understandable intention of insuring sufficient "operational" disc space under all circumstances. In order to exploit the "basic" space maximally, the best strategy for the user is to enter the terms with the largest number of postings before those with fewer postings. This consideration is significant only when the search strategy employs many category codes in addition to other terms which have a large number of postings.

FAILURE TO ANTICIPATE TERMS

Many recall errors resulted from an inability to anticipate all terms necessary for retrieval, although subject experts assisted in the search formulation. Examination of the titles of retrieved citations indicates that recall of about 30% of the searchers could have been increased by using additional terms. Major concepts, however, were rarely excluded from the search formulation.

Various browsing techniques, *e.g.*, the display of sample titles, the use of the expand capability, and the truncation of terms were employed to bring the language of the author and the searcher into conjunction.

The ability of the user to view a sampling of citations obtained from a particular search formula provides invaluable feedback on the validity of the strategy and an indication of additional relevant terms which might be incorporated into the search statement. Since the vocabulary is unstructured and there is no thesaurus to consult, one may easily and quickly make necessary modifications suggested by this browsing process. We found, using this method of successive search profile refinement, that in some cases the final search statement was markedly different from the initial one. The requester, who was present during the search, played a major and perhaps most important role in this particular phase of the operation.

In some cases, we carried the technique of iterative searching one step further. If the request statement involved many complicated conceptual relationships, the search operation was performed in two stages. Initially, it was conducted at its most specific level. After the documents were retrieved and the printout examined, the search was expanded to cover the additional desired elements. We found this approach to be more comprehensive and less costly in terms of computer time than an attempt to retrieve the information in one search session.

The "expand" command, which instructs the computer to display the terms which alphabetically precede and follow the entered term, can be used to identify additional entry words containing the same stem. It can be employed to great advantage, for example, to determine the proper entry form of an author's name. On the other hand, it is not obvious to these investigators that the results of expanding an entry word to discover alternate search terms justifies the online costs incurred.

Expanding the terms IMMUN and MICROBI consumed 5.09 and 4.42 minutes of computer time, respectively, before the commands were negated. Yet, not all possibilities containing these roots had been printed within the time given.

As indicated earlier, the truncation capability can provide a very powerful and effective search aid. It allows for the selection of additional terms, which contain the same root, thus making it unnecessary for the searcher to anticipate and specify them individually. Unfortunately, the present Lockheed program will not accept a truncation instruction which will generate more than a hundred different terms. It will, therefore, reject IMMUN*. As an alternative approach, it is necessary in this case to select IMMUNE* and IMMUNO*; this technique is still more efficient than expanding. It should be noted, however, that some false drops may be encountered among citations retrieved from truncations.

Although selecting IMMUNE* and IMMUNO* automatically includes such terms as IMMUNITY, IMMUNOLOGICAL, IMMUNOREACTIVE, IMMUNOSUPPRESSION, and IMMUNOASSAY, one must be aware that terms which bear no etymological relationship to the root being searched will often be directly related to the desired concept. Thus, in this case, the searcher would be required to incorporate the terms ANTIBODY, ANTIGEN, and AGGLUTININ, among other synonyms, into the search strategy. It is our understanding that Lockheed has plans to alter its truncation program sometime in the near future so that the number of terms which may be generated from a truncation operation will be enlarged. It may also be possible to search suffixes. (Verbal communication from Thomas Crawford, Lockheed Missiles and Space Company, Inc.)

TITLES OF ARTICLES NOT ADEQUATELY REFLECTING CONTENT

In examining the user-annotated citations which

resulted from our searches, we find that relatively few pertinent literature reviews were retrieved. This type of search failure is of special concern to the present investigators. In any retrospective search, review articles comprise one of the most desirable types of documents. Yet these are some of the more difficult citations to recall in a natural language indexing system, since by their nature they must be written with fairly general titles.

Consider the following paper, "Maximum Production Capacity of Food Crops", a review with a bibliography of 130 references. This article, which contained the section headings, "Biological Nitrogen Fixation", "Water and Fertilizer Management", "Carbon Dioxide Enrichment", "Plant Growth Regulants", "Multiple Intensive Relay Cropping", and "Reduced Tillage", was entered into the file on the basis of title words only; no enrichment had been provided for any of the concepts contained in the section headings.

The review, "Senescence and Postharvest Physiology", with 250 references, was not recalled in a search on plant hormones, although nearly one half the paper is devoted to that subject. The title was augmented with the term HORTICULTURAL CROPS.

IMPROPER SEARCH STRATEGY

A search strategy was considered improper if, on the basis of subsequent analysis of the citations, it was felt that the logic employed was at fault, e.g., if there was a faulty combination of concepts. Less than 1% of the failures could be attributed to this.

An error in search strategy was also considered to have occurred when searches were conducted at a level which was either too specific or too general for proper retrieval. While there were errors in judgment resulting in search programs which were too general, the greatest bulk of failures due to insufficient specificity was related to item #2 or item #3 above.

SUMMARY AND CONCLUSIONS

The expertise of the subject specialist as well as that of the information specialist was drawn upon in this study to devise and refine a search strategy which would retrieve documents of interest to the user and at the same time reject those which were of no value. By far the greatest problem encountered in the construction of search strategies was the difficulty in anticipating all the possible avenues to retrieval. Quite apart from the intellectual burden, the system did not easily permit the translation of the request statement into a search state-

ment because of an inability to express some concepts generically. Ideally, one would hope for a system which could incorporate some of the benefits of both controlled and natural language searching. In some respects there is an attempt to do this in the CAIN data base by title augmentation and the assignment of category codes. One of the advantages of an index based on keywords in title is that the indexing process is reduced to a series of clerical and machine operations, eliminating the need for interpretation of the indexed materials.

On the other hand, the user is not given the benefit of the possible advantages which might accrue from human intervention in the indexing process. It would be useful to have a thesaurus of enrichment terms that are applied uniformly to all documents entered into the file. Such a thesaurus would provide for indexer consistency in the assignment of terms as well as serve as one source of entry vocabulary for the searcher. Ideally, such an enrichment dictionary should be responsive to online queries.

In the light of our previous comments on retrieval of review articles, we are of the opinion that literature reviews should be prime candidates for title enrichment. Some attempt should be made to augment the titles by an in-depth analysis based on section headings, tables of contents, or summaries.

This abridged version of the St. Paul Campus Libraries' final report for CAIN online testing and assistance has reported some of the particular problems encountered in searching the CAIN file. We hope that our comments may be useful to other searchers. A copy of the final report may be obtained from Phyllis Reich, Chief Reference Librarian, St. Paul Campus Libraries, University of Minnesota, St. Paul, MN 55108.

INDEXING BY THE NATIONAL AGRICULTURAL LIBRARY

Maydelle Stewart
Indexing Section, NAL

The Indexing Section of the National Agricultural Library produces about 120,000 citations a year for the CAIN (CAataloging and INdexing) tape which is available from the Library at a nominal cost. All items, except those from unnumbered series such as annual reports and yearbooks, are published in the *Bibliography of Agriculture*. Approximately 6,000 serials and many monographs are scanned for material to index. Detailed scope notes are available for the subject categories under which the items are classed. In general, material is selected as it relates to food and agriculture. All literature on plants and insects is in scope on the theory that it is all of potential

agricultural interest. Other subjects—animals, microbes, climate, machinery, economics, etc.—are selected only as they relate to food and agriculture. For example: fish culture on the farm is selected, but not fish hatcheries; microbes pathogenic to plants or livestock or contaminating food are taken, but not pathogens of man or wildlife. Food products, whether agricultural or not, are selected through all stages of processing. Other agricultural products are selected only through primary off-farm processing unless the process is affected by properties of the raw material.

Non-subject criteria limit selection by timeliness, form and treatment. Special effort is made to index items by USDA personnel even when acquired more than a year late or when in a form or treatment not usually accepted, such as editorials, interviews, or popular and personal stories.

Approximately one-third of the items are enriched. Ambiguous titles are clarified. The common names are added for domestic animals, diseases, and the following plants: cereals, fiber, forage (except grasses), edible oil crops, sugar, tobacco, fruits, vegetables, coffee, tea and cocoa. The scientific names are added for insects, agriculturally important nematodes and pathogenic organisms, and the following plants: grasses, shade trees, forest trees, nut trees, ornamental plants, drug plants (except castorbeans), spice plants, essential oil plants, rubber plants, weeds, poisonous plants, miscellaneous economic plants and plants of unknown use. If more than three terms are needed, a more general term is used; for example, an article on corn, wheat, oats and rye may be enriched with the word "cereals". Other enrichment policies are established as retrieval problems come to the attention of the Indexing Section. Geographic descriptors have been added since mid-1973.

That which appears on the CAIN tape depends on indexing practices, but also policies and procedures of the entire Library. Material to be indexed must be selected, acquired, cataloged, recorded, and routed to the Indexing Section by other sections. The Library collects on a worldwide basis literature on agricultural subjects as exhaustively as possible given certain constraints of personnel and budget. The call number is a required part of the CAIN record; so items retained in the collection but not cataloged, such as dissertations, will not be in the record. Microforms, whether cataloged or not, are not indexed, and according to Library policy many reports and government and FAO documents are purchased only on microforms. Checking on lapsed subscriptions and claiming missing numbers are not done by the Indexing Section, so if the process is delayed, this combined with

an Indexing policy of not taking material over a year old may result in gaps in the indexing record. Serials which were not selected for routing to Indexing (or for that matter for purchase by the Library) may have occasional articles in scope, but it would be impossible to select all serials yielding only a few items a year. Any material which needs to be in the public catalog and also published in the *Bibliography of Agriculture*, such as the important USDA, state agricultural experiment station, state agricultural extension service, and other separately paged series, will be on the CAIN tape twice, once as a cataloging analytic and once as an indexing record. There will also be some duplicate items from the Food and Nutrition Information Center data base.

WORLD OF CAIN

Maydelle Stewart
Indexing Section, NAL

The *CAIN Online User's Guide* being prepared by Charles L. Gilreath, Texas A. & M. University Library was given a trial run at the National Agricultural Library December 10-12, 1975. Eleven librarians from the Library of Congress and NAL took part in a workshop to use and evaluate the guide before final revision and publication. The scheduled publication date is April 1976.

Charles Gilreath conducted the training and was assisted by Gus Kovalik, Hume Library, University of Florida, and Maydelle Stewart, Indexing Section, NAL. A method for continuous CAIN online training sessions is under consideration, which would allow for participation by non-federal people. Dates of future sessions will be announced in this newsletter.

DIRECTOR'S COLUMN

Visits to other libraries tend to put one's own administrative problems in perspective and help, also, to dispell any thought that one's own organization is the greatest. For the first time, since becoming Director of NAL, I have been able to fulfill some of my international responsibilities, with a trip to the United Kingdom and France in mid-November.

As a member of the Advisory Committee on the CAB/CAIN/BIOSIS project, I was introduced to the complexities of the bibliometric comparison of those data bases. NAL will soon receive listings of the results of the project, which should alert us to deficiencies in our coverage, in terms of serial titles, language, etc. A future issue of ALIN will contain a full review of the project.

The Libraries of the Ministry of Agriculture, Fisheries

and Food (MAFF) are the British counterpart of NAL. Frank C. Hirst, the Chief Librarian, and his staff provide service through 140 units. The Main Library, at Whitehall Place in London, is supplemented by collections in 8 or 9 other buildings in the London area, as well as libraries in the regional centers, divisional and area offices, and the experimental husbandry farms and horticulture stations. The Main Library is the regional center (UK and Erie) in the AGLINET world-wide cooperative loan system for agricultural libraries. It was a personal pleasure to observe beautifully bound and well-used USDA publications as an active part of this working collection.

The Tropical Products Institute (TPI) at Gray's Inn Road in London is a unique British Government organization dedicated to helping the less-developed countries derive greater benefit from their renewable natural resources. It has a staff of 380 scientists, engineers, and economists. The Information Department, administered by Brian Wills, and the Library, under the direction of John Wright, provide what is probably the world's outstanding source of information on tropical agriculture and the products of developing regions. As a librarian I stood in awe of the quality and depth of the indexing done here. Some 34,000 entries were added during the year, bringing the total number of entries to 675,000.

The Library of the Central Veterinary Laboratory at Weybridge is an important unit of the MAFF Libraries. The Librarian is David E. Gray, who has given us the excellent survey of veterinary information and its relationship to AGRIS. Here again, I was greatly impressed with the quality of indexing. I also had the pleasure of talking with a young woman on the library staff who was totally familiar with CAIN and used it with apparent ease.

A day in Paris was spent pondering the future of the *Quarterly Bulletin of the International Association of Agricultural Librarians and Documentalists (IAALD)*. The QB has been for some time primarily a European journal. I have hoped that we might encourage greater U.S. input, without appearing to take control of the publication. This is a sensitive area. I have made a proposal to the Executive Committee, which will be evaluated along with other proposals.

One comes away from a trip such as this impressed with the commonality of the tasks and problems of agricultural librarians and information specialists. One is impressed with the quality of our collections and the apparent ease with which we have accepted automation. But most of all, one is warmed by the friendliness and

genuine abilities of the people who make these libraries work.

— Richard A. Farley

NEW BIBLIOGRAPHIES

Ruth Pyne

Reference Division, NAL

Agencies of the Department of Agriculture, including field installations, preparing bibliographies, clear them with the National Agricultural Library before work begins. Clearance is handled by the Chief, Reference Division. Information submitted includes title and/or subject, scope, dates to be covered, agency, compiler, date when work actually begins, and probable completion date. In this column we will bring to our readers' attention proposed bibliographic projects submitted for clearance within USDA and, where possible, indicate the status.

In order to increase the usefulness of this column, our readers are invited and encouraged to submit information on bibliographic projects in preparation. This information should be submitted to Ruth Pyne, Reference Division, Room 300, National Agricultural Library, Beltsville, Md. 20705.

Following is a list of bibliographic projects submitted to date in 1975:

1. *An annotated bibliography of the diseases of water weeds and bank weeds.* Bernard R. Lipscomb. USDA, Agricultural Research Service Mycology Laboratory, Washington, D.C. Status: A 2-year feasibility study is underway.
2. *Bibliography of Bristlecone Pine (P. aristata).* U.S. Forest and Range Experiment Station, Library, Berkeley, Ca. Status: In preparation.
3. *Bibliography of the codling moth.* Bill A. Butt. USDA, Agricultural Research Service, Western Region, 1975. (ARS W-31) 220 p. Status: Published (NAL call no.: a S21.A75U5 no. 31)
4. *Pathogens of selected members of the papavera ceae—an annotated bibliography.* Chris G. Schmitt and Bernard Lipscomb. USDA, Agricultural Research Service, Northeastern Region, 1975. (ARS-NE-62) 186 p. Status: Published (NAL call no.: a S21.A75U45 no. 62)
5. *Rural development literature references, 1969-1975.*

James R. Madison, USDA, Rural Development Service, Washington, D.C. Status: Anticipated publication date, February 1, 1976.

NEW PUBLICATIONS OF NOTE

Arid Lands of Sub-Saharan Africa; Staff Progress Report, September 1973 - June 1974; Staff Final Report, July 1974 - December 1974; Appendices to the Staff Final Report. Staff reports, Advisory Panel on Arid Lands of Sub-Saharan Africa. Board on Science and Technology for International Development, Commission on International Relations, National Research Council, 1975; *Staff Progress Report*, 118 pp.; *Staff Final Report*, 36 pp.; *Appendices*, 277 pp.; limited number of copies available gratis from the Board of National Research Council, 2101 Constitution Ave., N.W., Washington, D.C. 20418.

Forest ecology and management. q. Amsterdam, The Netherlands, Elsevier Scientific Publishing Co. A new international scientific journal which will include papers of international interest on such subjects as: fundamental research on natural and man-made forest ecology and its application to forest management, nutrient cycling; energy and water fixation; ecological aspects of forest disease and pest control; effects of environmental pollution on forests; and other related subjects.

Integrated Pest Management: Rationale, Potential, Needs and Implementation. Prepared under contract by Environmental Protection Agency (EPA). College Park, MD, Entomological Society of America. 141 p. \$3.50. Order from: EPA, P.O. Box A.J, College Park, MD 20740.

Nutrient Requirements of Sheep, 5th ed., 1975 (Nutrient Requirements of Domestic Animals No. 5). Subcommittee on Sheep Nutrition; Committee on Animal Nutrition; Board of Agriculture and Renewable Resources, National Research Council. National Academy of Sciences, 1975. 72 pp.; ISBN 0-309-02212-6; \$3.00. Order from: Printing & Publishing Office, National Academy of Sciences, 2101 Constitution Ave., N.W., Washington, D.C. 20418.

North American Containerized Forest Tree Seedling Symposium. Proceedings. Denver, Colorado, August 1974. A few copies of this publication are available. Apply to: Acting Administrator, Cooperative State Research Service, Washington, D.C.

SURPLUS PUBLICATIONS

The following publications are surplus to NAL needs

and are offered gratis to any library needing them to complete gaps in its holdings. Deadline for receiving requests will be February 27. Requestors should send self-addressed mailing labels to:

Head, Collection Maintenance Section
4th Floor
National Agricultural Library
Beltsville, MD. 20705

1. *Academy of Management Journal.* v. 15, no. 1-3 (1972); v. 16, no. 3-4 (1973) v. 17, no. 2 (1974)
2. *Agronomy Journal.* v. 41, no. 1 - v. 60, no. 6 (1949-1968)
3. *Business Horizons.* v. 14, no. 1 - v. 17, no. 3 (1971-1974)
4. *Environment and Behavior.* v. 5, no. 1 - v. 6, no. 2, 5 (1973-1974)
5. *European Journal of Biochemistry.* v. 43, no. 3 (1974) v. 46, no. 1 - v. 49, no. 3 (1974)
6. *FGBS Letters.* v. 21, no. 1 - v. 46, no. 1 (1972-1974) *Master Index.* v. 31 - 46 (1972-1973)
7. *Florists' Review.* v. 154, no. 3996 - v. 155, no. 4021 (1974)
8. *Industrial Relations.* v. 11, no. 1 - v. 12, no. 3 (1973)
9. *International Economic Review.* v. 13, no. 1 - v. 14, no. 3 (1972-1973)
10. *International Social Science Journal.* v. 25, no. 1-4 (1973)
11. *Journal for Scientific Agricultural Research.* v. 17, no. 55 - v. 25, no. 91 (1964-1972)
12. *Journal of Dairy Research.* v. 29, no. 1 - v. 38, no. 3 (1962-1971)
13. *The Journal of Social Issues.* v. 29, no. 2-4 (1973)
14. *Modern Asian Studies.* v. 6, no. 2, 4 - v. 8, no. 1, 3 (1972-1974)
15. *National Advisory Commission on Food & Fiber - Technical Papers.* v. 1-4, 6-8 (1967)

16. *Public Finance*. v. 27, no. 1-4 (1972)
17. *Public Finance Quarterly*. v. 1, no. 1-4 (1973)
18. *Public Personnel Management*. v. 2, no. 1 - v. 3, no. 6 (1973-1974)
19. *Regional and Urban Economics Operational Methods*. v. 2, no. 1 - v. 3, no. 4 (1972-1973)
20. *Social Problems*. v. 20, no. 1 - v. 21, no. 4 (1972-1974)
21. *Soil Science Society of America Proceedings*. v. 1 (1936) - v. 32 (1968)

* * *

Federal Register. 1971-1973

Request from:

Spurgeon Terry
 Law Library, Room 1406S
 U.S. Dept. of Agriculture
 Washington, D.C. 20250

AGRICULTURE DATE BOOK

March 9-10: *NATIONAL FEDERATION OF ABSTRACTING AND INDEXING SERVICES*. Columbus, Ohio. Christopher Inn. "Information-Dilemmas, Decisions, Directions." Contact: NFAIS, 3401 Market St., Philadelphia, Pa. 19104.

March 17-18: *SYSTEMS DEVELOPMENT AT THE LIBRARY OF CONGRESS*. Washington, D.C. Spons., ALA-ISAD. Automated systems in operational, plng. & devpt. phases at LC covered in depth; tour of LC Processing Dept. opt. on 3rd day. D. Hammer, ALA/ISAD, 50 E. Huron Chicago 60611 (312-944-6780).

June 6-9: *SPECIAL LIBRARIES ASSOCIATION, 67TH Annual Conference*, Denver, Colorado. Direct all inquiries to: Special Libraries Association, 235 Park Avenue South, New York, N.Y. 10003.

June 27 - July 1: *WORLD FOOD CONFERENCE, AMES, IOWA*. Contact: Lorin E. Harris, Director, International Foodstuffs Institute, College of Agriculture, Utah State University, Logan, Utah 83231.

July 18-24: *AMERICAN LIBRARY ASSOCIATION ANNUAL CONFERENCE*, Chicago, Ill.

October 17-22: *INTERNATIONAL ASSOCIATION OF WATER POLLUTION RESEARCH*. 8th Conference, Box 2609, G.P.O. Sidney 2001 Australia.

October 31: *AMERICAN SOCIETY OF INFORMATION SCIENCES*, 39th Annual Meeting, San Francisco Hilton, San Francisco, CA.

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